

We claim:

1. A polyhydric alcohol based heat transfer fluid for use in a heat exchange system, said heat transfer fluid comprising:

(a) a first polyhydric alcohol consisting of ethylene glycol;

(b) at least one second polyhydric alcohol, wherein the second polyhydric alcohol acts as an alcohol dehydrogenase enzyme inhibitor and, wherein the second polyhydric alcohol has a boiling point above approximately 150°C; and

(c) at least one corrosion inhibitor additive that is soluble in the first and second polyhydric alcohols.

2. The heat transfer fluid of claim 1, wherein the corrosion inhibitor additive is selected from the group consisting of a molybdate salt, a nitrate salt and an azole.

3. The heat transfer fluid of claim 1, wherein the polyhydric alcohols comprise from about 85 percent by weight to about 99.85 percent by weight of the heat transfer fluid.

4. The heat transfer fluid of claim 1, wherein the second polyhydric alcohol is propylene glycol.

5. The heat transfer fluid of claim 4, wherein ethylene glycol comprises from about 0 percent by weight to about 99 percent by total weight of the total weight of the

polyhydric alcohols, and propylene glycol comprises from about 1 percent by weight to about 100 percent by weight of the total weight of the polyhydric alcohols.

6. The heat transfer fluid of claim 1, wherein the second polyhydric alcohol is glycerol.

7. The heat transfer fluid of claim 6, wherein ethylene glycol comprises from about 90 percent by weight to about 99 percent by total weight of the total weight of the polyhydric alcohols, and glycerol comprises from about 1 percent by weight to about 10 percent by weight of the total weight of the polyhydric alcohols.

8. The heat transfer fluid of claim 1, wherein the corrosion inhibitor is comprised of a molybdate salt in a concentration of between about 0.05 percent to about 5 percent by weight of the total weight of the heat transfer fluid.

9. The heat transfer fluid of claim 1, wherein the corrosion inhibitor is comprised of a nitrate salt in a concentration of between about 0.05 percent to about 5 percent by weight of the total weight of the total weight of the heat transfer fluid.

10. The heat transfer fluid of claim 1, wherein the corrosion inhibitor is comprised of an azole in a concentration of between about 0.05 percent to about 5 percent by weight of the total weight of the heat transfer fluid.

11. The heat transfer fluid of claim 8, wherein the molybdate salt is sodium molybdate.

12. The heat transfer fluid of claim 9, wherein the nitrate salt is sodium nitrate.

13. The heat transfer fluid of claim 10, wherein the azole is tolyltriazole.

14. The heat transfer fluid of claim 1, wherein the corrosion inhibitor is comprised of at least one of (i) sodium molybdate in a concentration between about 0.05 percent by weight to about 5 percent by weight of the total weight of the heat transfer fluid, (ii) sodium nitrate in a concentration between about 0.05 percent by weight to about 5 percent by weight of the total weight of the heat transfer fluid, or (iii) tolyltriazole in a concentration between about 0.05 percent by weight to about 5 percent by weight of the total weight of the heat transfer fluid.

15. The heat transfer fluid of claim 1, wherein

(a) ethylene glycol comprises about 70 percent by weight of the total weight of polyhydric alcohols in the heat transfer fluid;

(b) propylene glycol comprises about 30 percent by weight of the total weight of polyhydric alcohols in the heat transfer fluid;

(c) sodium molybdate comprises about 0.5 percent by weight of the total weight of the heat transfer fluid;

(d) sodium nitrate comprises about 0.5 percent by weight of the total weight of the heat transfer fluid; and

(e) tolyltriazole comprises about 0.5 percent by weight of the total weight of the heat transfer fluid.

16. A heat transfer fluid for use in a heat exchange system comprising at least one polyhydric alcohol having a boiling point above approximately 150°C and means for providing a polyhydric alcohol that acts as an alcohol dehydrogenase enzyme inhibitor.

17. The heat transfer fluid of claim 16, wherein the polyhydric alcohol that acts as an alcohol dehydrogenase enzyme inhibitor is propylene glycol.

18. The heat transfer fluid of claim 16, wherein the polyhydric alcohol that acts as an alcohol dehydrogenase enzyme inhibitor is glycerol.

19. The heat transfer fluid of claim 16, further comprising at least one corrosion inhibitor additive that is soluble in ethylene glycol and in the polyhydric alcohol that acts as an alcohol dehydrogenase enzyme inhibitor.

20. The heat transfer fluid of claim 19, wherein the corrosion inhibitor additive is selected from the group consisting of a molybdate salt, a nitrate salt and an azole.

21. The heat transfer fluid of claim 19, wherein the polyhydric alcohols comprise from about 85 percent by weight to about 99.85 percent by weight of the heat transfer fluid.

22. The heat transfer fluid of claim 19, wherein the corrosion inhibitor is comprised of a molybdate salt in a concentration of between about 0.05 percent to about 5 percent by weight of the total weight of the heat transfer fluid.

23. The heat transfer fluid of claim 19, wherein the corrosion inhibitor is comprised of a nitrate salt in a concentration of between about 0.05 percent to about 5 percent by weight of the total weight of the total weight of the heat transfer fluid.

24. The heat transfer fluid of claim 19, wherein the corrosion inhibitor is comprised of an azole in a concentration of between about 0.05 percent to about 5 percent by weight of the total weight of the heat transfer fluid.

25. The heat transfer fluid of claim 22, wherein the molybdate salt is sodium molybdate.

26. The heat transfer fluid of claim 23, wherein the nitrate salt is sodium nitrate.

27. The heat transfer fluid of claim 24, wherein the azole is tolyltriazole.

28. The heat transfer fluid of claim 19, wherein the corrosion inhibitor is comprised of at least one of (i) sodium molybdate in a concentration between about 0.05 percent by weight to about 5 percent by weight of the total weight of the heat transfer fluid, (ii) sodium nitrate in a concentration between about 0.05 percent by weight to about 5 percent by weight of the total weight of the heat transfer fluid, or (iii) tolyltriazole in a concentration between about 0.05 percent by weight to about 5 percent by weight of the total weight of the heat transfer fluid.

29. The heat transfer fluid of claim 16, wherein at least one polyhydric alcohol is ethylene glycol.

30. A method for reducing the toxicity of an ethylene glycol based heat transfer fluid comprising the steps of:

- (a) providing an ethylene glycol based heat transfer fluid; and
- (b) adding a sufficient amount of a polyhydric alcohol that acts as an ADH

5 enzyme inhibitor to reduce the toxicity of the heat transfer fluid.

31. The method of claim 30, wherein the polyhydric alcohol that acts as an ADH enzyme inhibitor comprises at least about 1 percent by weight of the ethylene glycol in the heat transfer fluid.

32. The method of claim 30, wherein the polyhydric alcohol that acts as an ADH enzyme inhibitor is propylene glycol.

33. The method of claim 30, wherein the polyhydric alcohol that acts as an ADH enzyme inhibitor is glycerol.

34. A fluid for use in absorbing water from a heat exchange system comprising:  
(a) a first polyhydric alcohol consisting of ethylene glycol; and  
(b) a second polyhydric alcohol, wherein the second polyhydric alcohol acts as an alcohol dehydrogenase enzyme inhibitor.

35. The fluid of claim 34, wherein the second polyhydric alcohol is propylene glycol.

36. The fluid of claim 35, wherein the propylene glycol comprises from about 1 percent to about 50 percent by weight of the total weight of ethylene glycol and propylene glycol.

37. The fluid of claim 35, wherein the propylene glycol comprises about 5 percent by weight of the total weight of the ethylene glycol and propylene glycol.

38. The fluid of claim 34, wherein the second polyhydric alcohol is glycerol.

39. The fluid of claim 38, wherein the glycerol comprises about 5 percent by weight of the total weight of ethylene glycol and glycerol.